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Arbor Day Number

White Pine

The Adirondack Forest

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The story of New York's forests, down to the year 1885, was a story of cutting down trees without any provision for renewing the supply, of forest deterioration and shrinkage of forest area. The destructive process in the State began with the first clearing by the first settler, and, keeping pace with the march of civilization, continued with increasing acceleration for nearly three centuries. Ways to protect the Adirondack and Catskill forests from the destruction that was threatening the few large forest areas remaining after years of unrestricted clearing for settlements, agriculture, industry and lumbering, were therefore uppermost in the minds of the founders of our conservation movement. Thus conservation in New York State, when it came, was impelled by the natural law of cause and effect.

The main thrust of the conservation attack was directed at driving out the money-changers from the temple. Scandalous traffic in the State's forest land and selling of the State's timber were the two dire threats when our major conservation laws were enacted, thus making protection of the forested table-land watersheds the keynote of the early conservationists; but nearly 50 years later commercialized recreation, as opposed to simple types of forest recreation, presented a new kind of threat to the wilderness ideal that has become firmly rooted in the public consciousness.

The proposed Porter-Brereton Recreation Amendment to the State Constitution, though defeated at the polls, November 8, 1932, was significant of the changing popular interest, or rather of the new interest, in the Adirondack Park and Forest Preserve. For nearly 50 years the public's concern with the Adirondacks had been largely in the conservation problems that can be grouped under the heading "protection." The lively debate of the proposed recreation amendment indicated among other things that the word "use" had assumed a place of equal importance in many minds. The object of this article, therefore, is to explain briefly the underlying aims of the park and preserve, and the background of events from which they evolved; and then to enumerate the many and conflicting ideas for making the park afford its best use to its owners — the people.

Until the last half century, little thought was given to our New York forests except how they could be cut down with greatest profit. In the day of the red man magnificent forests of hard and soft woods covered practically all the 30,489,560 acres that now comprise New York State. Today less than 1 per cent of virgin forest remains as a monument to the lost forest empire. White civilization needed the land and the lumber, and shrank the forest area to 12,000,000 acres. Much of this is forest of decidedly inferior quality; 4,500,000 acres are in farm woodlots and 7,500,000 acres in large forest areas. Although three-fifths of the large forest area is in the Adirondacks, more than half of it is privately owned.

Lumbering began on the fringes of the Adirondack wilderness about 1813. Donaldson likened the march of the lumbermen to that of an invading army attacking and destroying the outposts first, and only gradually slashing a way to the inner citadel. The early lumbermen deemed the forest inexhaustible, and did damage because they lumbered carelessly and with little thought for the future. Their worst sin was the fire hazard that they left in their wake. The damage and waste of the era of unrestricted lumbering in the Adirondacks was so great that reform measures, when the State finally took notice, were equally drastic and barred lumbering and the practice of forestry forever from the forest preserves.

Verplanck Colvin, of Albany, and Dr Franklin B. Hough, of Lowville, were among the first to sense the disaster that would come to the economic and social life of the State if the forests on the Adirondack table-land were destroyed, and were the first to advocate the creation of an Adirondack park or timber preserve.

Strangely enough, their proposals (1868) coincided with the time when New York lumber production was reaching its peak (1869) and Albany was the largest lumber market of the world. From then on they urged the establishment of a forest preserve vigorously and unceasingly until it became an accomplished fact. It should be noted that although the most important considerations with the early conservationists were preservation of the tim-

The Giant Range

ber, prevention of erosion and protection of water supply, Colvin's pioneer arguments also included preservation of scenic beauty, and recreation and health.

The year 1885 marked the turning point from an old order to a new when the Legislature on May 15th set aside more than a third of the area of the State (the Forest Preserve counties) as potential forest preserve. The measure provided that all state land then or in the future owned in the counties of Clinton, Essex, Franklin, Fulton, Hamilton, Herkimer, Lewis, Saratoga, St Lawrence, Warren and Washington should constitute the forest preserve. Oneida county was added in 1887. The regulations were few and simple:

"The lands now or hereafter constituting the forest preserve shall be forever kept as wild forest lands. They shall not be sold, nor shall they be leased or taken by any person or corporation, public or private." The act also authorized a Forest Commission to administer the preserve, and contained the first provisions for fighting and preventing forest fire.

The Forest Preserve law, as the name signifies, concerned *preservation* only. *Use* of a portion of the preserve as the Adirondack Park was authorized seven years later by the Legislature. As amended the following year, the purpose of the park was defined: "Such park shall be forever reserved, maintained and cared for as ground open for the free use of all the people for their health and pleasure, and as forest lands necessary to the preservation of the headwaters of the chief rivers of the State and a future timber supply, and shall remain part of the forest preserve." Originally the Adirondack Park included only certain specified state land. In 1912 the definition was changed to include all public or privately owned land within the "Blue Line." The Blue Line was extended in 1931 so that the park now comprises 4,604,000 acres, of which nearly half is state forest preserve land.

Although the Forest Preserve law prohibited sale of preserve lands, politics almost immediately crept into their administration, making circumvention of the law easy. To make the situation more unsatisfactory a bill was passed in 1893 giving the Forest Commission authority to sell timber from state land. The abuses under legislative control, actual or possible, were so great that the champions of forest protection became convinced that the intent of

the park and preserve could be safeguarded only by putting them under constitutional protection. They accordingly drew an amendment to the State Constitution, section 7 of article VII, that was adopted in 1894, in compact and impregnable language to put an end to the evils of the situation: "The lands of the State, now owned or hereafter acquired, constituting the forest preserve as now fixed by law, shall be forever kept as wild forest lands. They shall not be leased, sold or exchanged, or be taken by any corporation, public or private, nor shall the timber thereon be sold, removed or destroyed." The authors and friends of article VII, section 7, fully realized that it was not ideal, but they knew American political conditions did not afford safeguards to make possible forests patterned after those of the Old World. The need of the moment was forest salvation, and scientific development had to be sacrificed to the urgent need.

Although the electorate of the State has not seen fit to change its mind in regard to letting down the bars within the Adirondack Park, in 1931 there was added to the Constitution a new section, 16 of article VII, to allow the State to acquire, reforest and manage under scientific forestry practice land in the Forest Preserve counties outside the park that should not become part of the Forest Preserve. These Hewitt production forests can be established on cheap, idle or unproductive land anywhere in the State outside the Adirondack or Catskill parks. The plan contemplates the largest reforestation project undertaken by any of the states. As New York had been moving rapidly toward timber bankruptcy, the Hewitt reforestation program, besides being wise and farsighted forestry policy, will forestall the day when the park forests might be imperatively needed for lumber.

Until 1920 the State did but little to help the people avail themselves of the recreation values existing in the Adirdondack Park. Commencing with an initial appropriation from the Legislature of only $1500, in 16 years the progress has been great under the efficient management of the Division of Lands and Forests of the Conservation Department. While this great park originally was maintained primarily as a means of conserving wild forest for a timber preserve and watershed protection, it is also utilized now by millions for recreational purposes. All of the preserve, excepting the

Avalanche Pass from Marcy Dam

game refuges, is open to the public in proper season for hunting and fishing. Six hundred miles of forest trail and about 150 open lean-to shelters are maintained throughout the preserve for hikers, campers, mountain climbers, hunters and fishermen. At 28 great public camp sites along automobile roads or adjacent to bodies of water 600,000 people made use of free camping service in 1932.

All development of the Forest Preserve so far has been in keeping with the spirit and intent of the law that created the park, which Justice Hinman thus defined: "The idea intended was a health resort and playground with the attributes of a wild forest park as distinguished from other parks so common to our civilization. We must preserve it in its wild nature, its trees, its rocks, its streams. It was to be a great resort for the free use of the people in which nature is given free rein. Its use for health and pleasure must not be inconsistent with its preservation as forest lands in a wild state. It must always retain the character of a wilderness. Hunting, fishing, trapping, mountain climbing, snowshoeing, skiing or skating find ideal setting in nature's wilderness. It is essentially a quiet and healthful retreat from the turmoils and artificialities of a busy urban life."

Many persons, whose altruistic interest in the State's forests is beyond question, hold views as far apart as the poles as to the future development of the Adirondack Park. At one extreme are those who believe in inviolate wilderness as a precious heritage that each generation should faithfully preserve and hand down intact to the next. At the other are the advocates of improving the quality of the forests and making them self-sustaining by putting the preserve under scientific forestry management. Between the two extremes are proposals for a revision of classification of State-owned Adirondack lands and for a survey of the Adirondack Park by a commission of park and forestry experts, to find out how it may afford a maximum of recreation values to the people; and the principle, followed in the National Forests, of putting units of land to their highest use. Then there are a great number of minor propositions, related and unrelated to the general theorems, that are being thought and talked about. The following are typical:

Expansion of the trail and shelter system along present lines

Need for attended closed cabins patterned after the White Mountain Appalachian Mountain Club Hut system

Need for ski and bridle trails

Zoning Adirondack Park for (*a*) wilderness areas, (*b*) semiwild areas, (*c*) development areas

Winter cabins in the interior of the preserve

Clean-cut separation of park and forest preserve lands

Consolidation of the State's holdings on the upper Hudson watershed

Appropriations for purchase of more park land

Removal of dead, down and ripe timber from the Forest Preserve

Zoning Forest Preserve for (*a*) no cutting, (*b*) selective cutting, (*c*) productive forestry practice

Vigorous defense of article VII, section 7, against any further modification

Reasonable amendments that will properly safeguard the State to allow the building of state and county highways across state land without a constitutional amendment each time

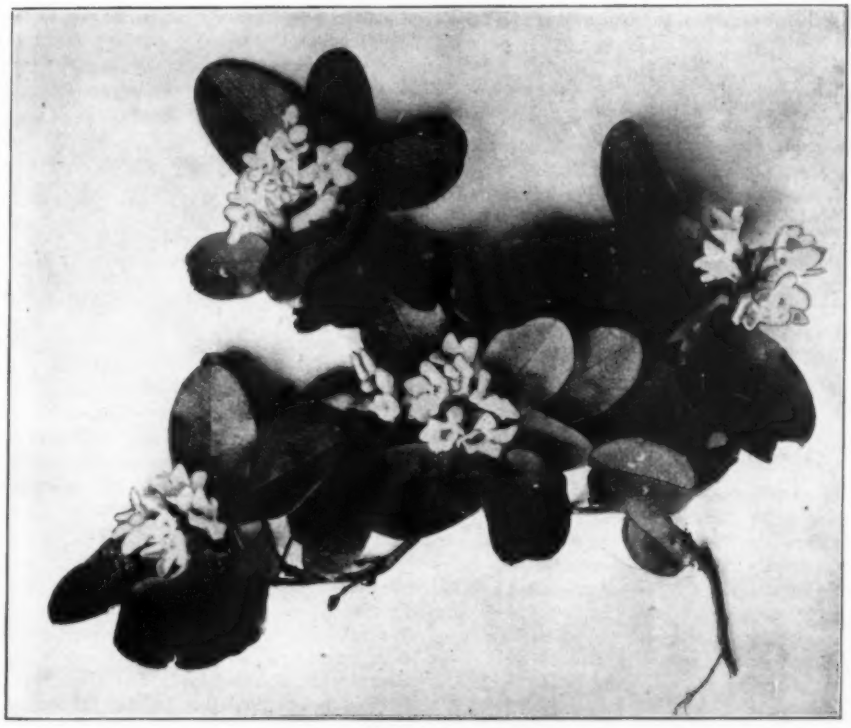
Fire truck trails

It has been a natural development of ideas that the conservation problem in New York State has divided itself into the two important elements of *protection* and *use* of the public forest. Both of these elements are good, but either, when carried to extremes, can work incalculable harm to the Adirondack Forest Preserve. Somewhere between the two is a mean which will faithfully preserve the wild character of the preserve and at the same time permit it to afford wide and wise recreational values to the people. Protection of soil, water sources and forest wilderness carried to radical lengths would keep most people out of the woods, which certainly was not the intent of the founders. Even the most wisely devised plans for simple recreation use, in keeping with wild forest conditions, destroy some degree of wilderness.

It is a difficult problem that rests on an ancient paradox, for the fathers of our conservation gave us the two legacies: "The lands of the State, now owned or hereafter acquired, constituting the Forest Preserve as now fixed by law, shall be forever kept as wild forest lands," and "for the free use of all the people for their health and pleasure." The New York State Conservation Department, which is the

faithful and trustworthy official custodian of the preserve, and private conservation organizations, which are analogous to interested stockholders committees, are making sincere efforts to find the mean, which contains the solution to the real problem confronting present-day conservationists. It can be taken for granted that there will be no commercializing of the preserve. Possibly the best solution for the remaining use problems lies in the zoning principle, whereby certain large areas would be set aside as genuine wilderness areas, others as semiwilderness areas, and still others as simple recreation development areas. The Adirondack Park, comprising approximately an eighth of the entire area of the State, seems large enough to satisfy abundantly every degree of social need and esthetic taste.

Wolf Jaws



Mayflower or Trailing Arbutus

Trailing Arbutus

ELSIE GIBSON WHITNEY, NEW YORK STATE MUSEUM

Among the plants named in our State Law, as set apart for special protection, *Epigaea repens* — trailing arbutus or mayflower — quite apart from all the others seems to hold a special place in our affections. Its spicy fragrance, the crisp and waxy texture of its pink and white blossoms would be appreciated in any flower. But the esteem in which we hold it lies as much perhaps in other factors as in its intrinsic beauty.

No small part of this sentiment is due to the fact that as one of the earliest of our spring flowers the trailing arbutus indicates an end to the cold winter and gives assurance of the coming glorious spring days — a season of the year which is found at its very best in that section of our country where this wild flower makes its home. Were the arbutus to have its season of bloom in late summer, would we take any more notice of it than we do of the partridge berry, for instance, the blossoms of which are in many ways similar?

The habits of this plant are so distinctive that one never entirely outgrows the first delightful surprise at finding the little clusters of exquisite flowers hidden away on the ground, not only under the evergreen foliage of the plant itself, but not infrequently under a layer of fallen leaves and plant débris from other vegetation which has helped to protect it through the winter's cold. The translation of its scientific name — *Epigaea repens* — "reclining upon the ground," describes briefly its growth habit. The slender woody stems of this member of the "heath" family are so loosely attached to the earth by a few scattered roots that the plants give the impression of

(*Continued on page 148*)

The University of the State of New York
Bulletin to the Schools

Issued semimonthly during the school year by the State Education Department

CHARLES F. PROBES, *Editor*

This bulletin is sent without charge to all schools and educational institutions of the State. To others it will be mailed postpaid for 50 cents a year, 5 cents for single copies.
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APRIL 1, 1936

Arbor Day Proclamation

In accordance with the provisions of law requiring the Commissioner of Education to fix the time for the annual observance of Arbor Day in this State, the dates of April 24th, May 1st and May 8th are hereby named. With the local school authorities is placed the responsibility of determining which date will best serve each community, and of conducting such programs and exercises as are agreeable and fitting.

After a winter of unusual severity, we are this year especially rejoiced at the approach of spring. The advent of this happy season is marked by the budding of trees and flowers, the cheering presence of birds and all the awakening beauties of nature. The attractive foliage, the blossoms of the trees and the trill and warble of the feathered songster make glad our hearts within us and remind us, that, in the midst of these troublous times, "hope springs eternal in the human breast." Thus are men and women sustained and enabled to continue on their way.

It is well that we should be encouraged to foster these blessings coming from the hands of a beneficent Creator. For practical reasons, too, we should embrace the opportunity to develop Nature and add to her usefulness. Both in the State of New York and the Nation as a whole, reforestation of certain areas and culture of the woodlands and forests have now become a settled policy and are more and more engaging the attention of patriotic and thoughtful citizens. Therefore, as Commissioner of Education, I designate these days and urge our people that they be actively observed by teaching our school children, citizens of the morrow, to plant trees in suitable numbers and to appreciate their beauty and economic importance.

FRANK P. GRAVES
Commissioner of Education

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Trailing Arbutus

(*Continued from page 147*)

having been dropped there in passing, and of just beginning to take root. The common name "trailing arbutus" also indicates this habit. It is not hard to imagine the early settlers along our Atlantic shores, coming upon this new and to them unknown plant, and seeing in the general shape and texture of its leathery evergreen leaves and its clusters of flowers a resemblance to their familiar European arbutus or "strawberry tree," at once describing it to their fellows as a "trailing" arbutus.

To these early American colonists the plant must have been a much more familiar sight than it is to the present inhabitants of this area. We need but to picture the extensive forests that covered a large part of our present cleared and cultivated lands, and recall that it is in such situations that trailing arbutus still grows at its best, to believe readily some of the traditions concerning the former abundance of this plant and the great size of its flower clusters. Large colonies sometimes survive the cutting of a forest for a few years, but the reduced size of the leaves, the smaller individual flowers as well as the smaller clusters, the loss of a "thrifty" look—all bespeak the plant's unhappiness in such situations.

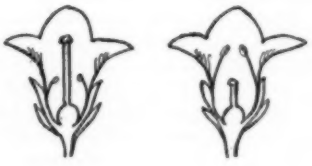
Other unfavorable conditions combined with the destruction of forest cover have served to make this plant so rare that we now are trying by protective laws to save it from extinction. Some of these conditions are characteristics inherent in the nature of the plant itself.

Like other members of the heath or blueberry family, trailing arbutus has a sparse root system, inadequately equipped for supplying its own needs. But associated with such roots as there are, is always to be found a fungus which in this symbiotic living supplies moisture and minerals from the soil and gets from the plant certain foods manufactured by its green leaves.

The fungus requires for its existence the moisture conserved by forest cover, the more even temperature made possible by such surroundings and the litter of the forest floor. A combination of these conditions in an area of well-drained, gravelly, acid soil gives the ideal situation for the finest development of trailing arbutus. Such a situation, however, carries with it considerable danger from ground fires. And with so slight an anchorage in the soil, trailing arbutus has a difficult time surviving this scourge. Next to the removal of the forest cover, fire has certainly been one of the chief agencies in bringing about the present scarcity of this plant.

Another characteristic of the plant itself which makes it difficult to hold its ground under adverse conditions is the infrequency and uncertainty with which it produces seed. On some of the plants are found flowers in which well-developed stamens furnish a supply of good pollen, but in which the pistils are incomplete or abortive. Other flowers have pistils with large and fully-developed stigmas, but with abortive stamens (see illustration below); and many combinations or stages of these two conditions are found.

But only the flowers with well-developed stigmas are capable of producing seed, and these seem to constitute but a small percentage of



the abundant flowers of this species. Furthermore, this plant falls into that group in which pollination, that is, the mechanics of getting pollen from the anthers to the stigmas, is accomplished by means of the visits of insects in search of nectar or pollen. The commonest insect visitors to the blossoms of trailing arbutus, and therefore the chief agents of pollination, are the queen bumblebees. During the blooming period of this wild flower in April and early May, however, it is not uncommon for the weather to be so cold or so rainy for many days at a time as to keep the bees from their usual activity. Thus is added another hazard in the process of producing seed.

When proper pollination does occur, a small fruit about as large as a medium-sized blueberry is matured, hidden away under the newly developed leaves of the season; and this fruit contains up to a hundred or more seeds. When the seeds are ripe, the plant itself has no provision for scattering them widely; but their dissemination to new areas away from the parent plant depends largely on the chance visits of small animals — ants, slugs etc. — which feed upon the fruits in their wanderings.

With such an array as this of the difficulties to be overcome by the plant in its struggle for existence, it is not surprising that it has been waging a precarious and losing battle against the many changes in its environment contingent upon human activities. We can, however, give it at least a sporting chance to hold its own, and refrain from making its lot any more difficult through our selfishly possessive habits.

Since the new growth of the season starts near the blossom spray, the picking of such a branch, even if done so carefully that the roots of the remaining plant are undisturbed, removes the possibility of those flowers producing seed, and eliminates at that point the new growth and the formation of flower buds for the following year.

If each of us who deplores the disappearance of this one of our choicest wild flowers, sets for himself a discipline of never disturbing the plant in its natural surroundings, and discourages the buying of its flowers offered for sale, it may be possible to save it until some of the present dangers are over. With the replanting of many of the State's idle acres it is to be hoped that in time forest conditions may be reestablished similar to those in which the arbutus flourished at its best. Then through natural agencies of dispersal we may expect that it will slowly reoccupy much of its lost territory, until at length it can safely be removed from the list of rare and rigidly protected plants.

Forestry for Young People

JAMES D. POND, ASSISTANT EXTENSION FORESTER, NEW YORK STATE COLLEGE OF AGRICULTURE, ITHACA

The increasing emphasis laid upon forestry and conservation developments in this State and throughout the United States places added interest upon the theme of Arbor Day, when school children plant trees, shrubs and flowers. While this day has brought improved esthetic development of school yards and has been a great influence in furthering an interest in Nature, the young people, especially in the rural districts, have been pursuing a like course in a definite forestry program which goes beyond planting of individual trees here and there, which aims to round out an elementary knowledge of forestry and conservation measures as they apply to farms and their woodlots, and, which through them, leads to greater economic improvement in the communities. While the State has been reforesting thousands of acres, these young people have been doing their part, setting out one acre or more apiece on their home places, and following this up through study and example to learn definite uses and means of improvement for their woodlands.

Reforestation

Ten million trees have been planted by the farm boys and girls in New York State during the past ten years. This project was started by the 4-H Clubs in 1927 and was joined by students in vocational agriculture in 1933. Reforestation is the first work undertaken by these young people in the junior forestry project, which for the 4-H Clubs carries through three years.

Through a cooperative arrangement with the State Conservation Department, the New York State College of Agriculture and the State Education Department, each beginning forestry worker — 4-H Club or Forestry Enterprise for the vocational students — receives 1000 free trees. He, or she — for there are nearly a thousand girls who have planted trees — has a choice of seven species to plant and may take all of one kind or 500 each of two kinds. Mixed plantations are recommended, for they more nearly approach Nature's own conditions found in the forest, and besides, offer an opportunity to obtain an intermediate crop of posts, poles, pulp wood or Christmas trees from thinnings. Although the trees are furnished free, the boys and girls must pay shipping charges. Often the county club agents and vocational agriculture teachers cooperate to truck the trees from the nearest state forest nursery.

To obtain the highest survival of the trees set out, demonstrations in tree planting are given by the extension foresters from the New York State College of Agriculture, who travel into nearly every county to show these young tree planters how to lay out an acre plot and to plant their trees. Besides the 4-H Club members who are contacted by the extension foresters and who are also instructed by the county club agents, 105 departments of vocational agriculture received instruction through group demonstrations at centrally located spots.

The 4-H Club members had a seven-year start and through 1935 had planted 8,386,000 trees under this arrangement. This year 1,066,000 trees will be planted by club members. From 1933 to 1935, young farmers set out 897,000 trees, and pushed their total far above the million mark with the 535,000 trees which they have ordered through 115 schools this spring.

The State Conservation Department has a goal toward which it feels these plantations made by young people on the farms are reaching, so that every farm will have from one to five acres of softwood plantations. For the softwoods supply the easily worked timber which has built most of the houses and barns from the time the early settlers first entered the Hudson valley. When these pioneers started clearing lands, they failed to note the differences in soils, elevation and grade which are now important factors in the decision as to what lands should be cultivated. This widespread land clearing resulted in many acres of steep, thin-soiled farms which are not suited to intensive farming and which can best be put to work growing trees. Cutting of the softwoods left the hardwoods, which have been used comparatively recently. Silviculture, or the care and cultivation of the forests, is a long-time practice, but the farmer who plants trees finds that his plantation is making the best use of lands which were formerly losing money under cultivation or altogether unproductive.

An Advanced Forestry Program

Forestry has a practical as well as a romantic interest for nearly all young people. Since it is impossible for them to trek through the un-

An Otsego County 4-H Club Boy and His Scotch Pine Planted in 1930

limited forests which existed in colonial days, they carry their interest in the out-of-doors into the farm woodlots. Each farm averages more than 20 acres of woodland, so that the farm boys and girls find the opportunity at their very doors to practise forestry. The farm woodlot plays a part of increasing importance in furnishing material for use in local wood-using industries, besides supplying fuel and lumber for home consumption. Many a farm has been saved by its "wood's bank" in which the interest through added growth has been conserved until needed. Most of the woodlots are found on better soils than occur in the forest regions of the State in the Adirondacks and Catskills, and grow more rapidly as a result. This better growth deserves better care and is receiving this attention through the training which the boys and girls obtain through the extension forestry program.

For those young people who wish to learn more about the trees and about the practice of forestry, a continuing program in the 4-H Clubs, to be carried through two more years, has been developed by the extension foresters. This work was outlined to include elementary instruction in tree identification and woodlot management and to teach simple methods of scaling logs and estimating timber. Similar work along the same lines is being developed for vocational students and for out-of-school young men who attend short courses in the spring.

The tree identification work is carried out through contests, demonstrations and bulletins. Each second year youngster, in this half of the project, learns to identify and collects the leaves, twigs and fruit from ten or more species, including those trees represented on his home woodlot. These specimens are mounted by the club member in special folders provided by the club organizations and, in June, are handed in to be judged by the assistant extension forester.

The second part of this project consists of woodlot management. For nearly 20 years a program of adult education in woodlot improvement has been carried on throughout the State but since it is sometimes difficult to get "an old dog to learn new tricks," now we are trying to teach the boys. Each worker lays out a quarter of an acre in the home woodlot, marks the trees which should be cut, and harvests the wood products for home use and for sale. The undesirable trees of weed species, the poorly formed stems, saplings too crowded, diseased and insect-infested trees, all come out in this forest cultural work. Trees that the young forester learns to leave and help are the crop trees, rapid growing, valuable species which in the future will furnish saw logs for home consumption and for sale.

When the wood from the trees has been cut, the boy measures the number of cords of fuel wood, counts the posts, poles and grape stakes, figures the number of board feet of lumber which have been cut and keeps a financial record. In addition to the improved condition of the woodlot, which has been obtained through proper thinnings and cleanings, the young woodsman usually clears a profit, often at the rate of $20 to $40 an acre, and still has a fine growing stand of trees left. Many of these club members have continued beyond their little plots to improve the rest of their home woodlands. In addition, they learn the value of a fence to keep the stock out of the woodlot, for trees and stock can not grow up together.

The third and last year's work is more technical, but still practical, for the farmers with wood products to sell are usually unable to calculate the volume of the timber after it is cut, to say nothing of estimating in thousands of board feet a stand of growing trees. These club members learn how to scale or measure logs, and soon use to advantage the knowledge gained when their parents cut some logs for sale.

Timber estimating practices are taught through demonstrations and bulletins which give simple directions for finding the amount of lumber or the number of cubic feet of wood in standing trees. The young estimator makes a handy surveying instrument with which he lays out the boundaries of an acre in the woodlot. On this acre, using a simple hypsometer, or height measuring instrument, which he has made at home out of a piece of wire and a box board, the boy, or girl — for the girls, too, carry on this interesting phase — obtains the heights of all of the merchantable trees on this small tract. For each tree he also measures the diameter with a tape on which he has converted circumference into diameter. From tables supplied in the bulletins, the estimator calculates the total amount of timber on his plot. As more and more woodlot owners realize the benefits accruing to those who have more than a mere guess at the amount of timber which they own, these amateur foresters will be finding opportunities for employment as timber estimators and timber markers.

Some work has already been done with vocational students in woodlot improvement. Two schools that do not own wooded property have worked out cooperative agreements with farmers whereby the students mark the timber for an improvement cutting, cut the wood on shares and put the proceeds into their Young Farmers' treasury.

School Forests

School forests are not new to New York State. The Conservation Department report for 1935 shows that for the five years ending 1934 approximately 530,000 trees were planted in school forests besides those forests established from 1910 to 1929. These were complemented by additional plantings in 1935 and this year by a number of new schools which are making use of tracts of land acquired with purchase of sites for centralized schools. Most of the planting on these school forests has been done by school children. In many cases a whole day has been set aside for Arbor Day, which could be observed in no more fitting manner than by setting out several acres to young trees.

To handle large groups of tree planters, the extension foresters have developed the "rope and whistle" method of planting. A rope, on which pieces of cloth have been tied every six feet, is stretched across the field to be planted, and is carried by two boys. Each team of planters — one boy with a mattock to dig the holes and the other to set the seedlings which he carries in a pail — takes its place by each cloth marker. The rope is laid on the ground, the group leader blows his whistle, the mattock swingers dig the holes, the planters set the trees, and the rope is moved forward six feet ready for the next line of holes.

The pride and joy with which these youngsters watch the plantations thrive are increments beyond measure. While financial returns to the school district may be 20 to 60 years in the future, the value in example and demonstration of these school forests will have a long-continued influence in the community.

Tours and Prizes

Recreational activities are continued along with the work and instruction program. Each fall for the past three years an Adirondack 4-H Club Forestry Tour has been conducted in cooperation with the Conservation Department. Last year 99 club leaders and members attended, including 72 boys and girls. Trips were made to the Lake Clear Forest Nursery, near-by fire towers, state plantations set out in 1912 at Lake Placid, the Mount Von Hoevenberg bobsled run, Olympic ski jump, and Fish Creek Pond Camp Site. Contests in wood chopping and tree

Measuring Heights of Trees

identification were also held. Club members attending were sent by various conservation and forestry clubs, by newspapers, by Granges, by Farm Bureaus and by interested individuals for having made the best records in tree planting and tree identification.

In addition to this tour other activities for forestry-minded young folk are conducted throughout the year. Wherever adult woodlot meetings are held, the near-by departments of vocational agriculture are invited to attend and to bring their students. Each fall seven counties in western New York have a forestry field day at Letchworth Park, with an outdoor meal, contests and awarding of medals earned by club members in the various forestry activities and presented by the Buffalo newspaper which sponsors the gathering. Individual county field days include demonstrations, outdoor cookery, and chopping contests, so that summer and winter these young people follow up their interest in forestry. The American Forestry Association helps to promote woodlot improvement work through the donation of medals to the three best club members completing the log scaling and timber estimating project, in addition to a plaque which is kept at the school attended by the winner. The New York State Forest Products Association gives a trip on the Adirondack Forestry Tour, a book and a magazine subscription to the three highest in the tree identification and woodlot work.

Statistics are not the only means of measuring interest and benefits in forestry educational work. The improved health, the broadened outlook, the increasing development of leadership and responsibility — all are factors which give immeasurable dividends. While these youngsters have planted to trees about 10,000 acres of otherwise useless land, they are not missing the opportunities that follow when young people and trees grow up together.

New York State's Reforestation Program

ARTHUR S. HOPKINS, ASSISTANT DIRECTOR, LANDS AND FORESTS, STATE CONSERVATION DEPARTMENT

To the average person, large numbers seldom mean a very great deal, and the mere statement that since the beginning of the enlarged reforestation program in 1929 the State Conservation Department, through its ten district foresters, has planted upon idle and abandoned farm lands more than 135,000,000 trees can not possibly convey any conception of the time and effort involved. Therefore, in order to indicate even briefly the work involved in planting this number of trees, it is necessary to go back to the beginning of the work in 1929.

It was in that year that the plan providing for the acquisition and planting of 1,000,000 acres of idle and abandoned farm land prior to 1944 was first formulated. In 1931 the program was approved by the voters of the State at a general election and incorporated in the State Constitution as article VII, section 16. From that time, reforestation activities have been carried forward as rapidly as possible, although not at the anticipated rate, on account of reduced appropriations made necessary by the condition of the State's treasury.

At the outset, the State was divided into ten districts with a resident district forester located in each, and the activities were confined in accordance with law, to those sections of the State lying outside of the Adirondack and Catskill Park Blue Lines. The first work of these men was of course the acquisition of land, and this was made slightly more difficult by the provision in the law that no areas of less than 500 acres could be acquired. Furthermore, in many sections of the State the Department and its work were not very well known. After the first few months, however, it became evident that there would be no difficulty in acquiring the necessary land, and during the subsequent years the land acquisition work has been limited solely by the funds available.

At present approximately 316,000 acres have been contracted for at prices averaging $3.88 an acre and not exceeding $4 an acre. Of this amount, 245,000 acres have actually been paid for.

After a land contract is secured from the owner, the title is examined by the Department of Law and surveys are made under the direction of the district foresters. Payment for the land follows upon the approval of title, after which planting operations and other work can be initiated.

At the beginning of the program, schedules were set up of the annual acreage to be acquired and planted, and in order that the Department might have time to raise necessary trees, the land acquisition schedule was in excess of the tree planting schedule for the obvious reason that it takes time to secure tree seeds, plant them in the nursery and raise them to three years of age. The maximum annual rates set up were the acquisition of 100,000 acres and the planting of 100,000,000 trees. Previous to that time, the annual production from the Department's nurseries was approximately 25,000,000 trees a year, so that it was necessary in the beginning to enlarge the existing nurseries and to acquire an additional one, making a total of six forest nurseries whose major function is the production of trees for planting under this program. The nursery operations of seeding, weeding, watering, transplanting, fertilizing and shipping can not be gone into in detail here. It may be said that the State of New York during the past few years has been one of the largest producers of forest planting stock in the entire world.

Again, the various methods of planting the trees in the field upon the newly acquired lands are too technical and involved to be explained briefly. No trees are planted until the district forester has made a careful examination of the area to be planted, from which a detailed plan is prepared, so that as far as possible the tree best suited to a particular planting site may be used. A plan of operations or planting schedule is prepared each spring and fall for the two planting seasons. This schedule is prepared by districts and is furnished to the various nursery foremen, who ship the planting stock by truck as called for by the district forester. In passing, it has been found that it is of great importance that the stock arrive at the planting site promptly and in good condition. Some idea of the magnitude of these planting operations may be gathered from the fact that in some years the Department has expended nearly $200,000 for labor on the tree planting work alone.

After the areas have been planted, it is the duty of the district forester to protect the newly planted trees from forest fires, insects and disease, and later when they arrive at a suitable age, these men will also be called upon to plan and execute the necessary thinnings, prunings and release cuttings.

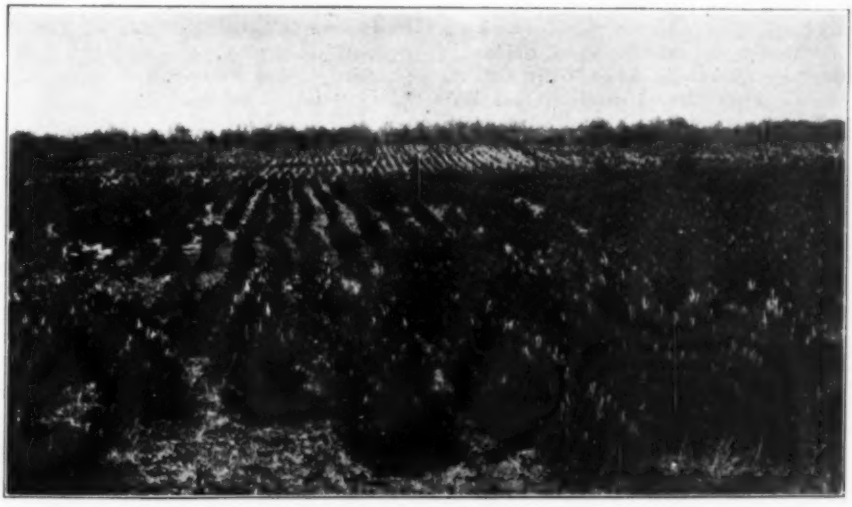
During the past two years the Department has had as many as 31 C. C. C. camps of 200 men each, working upon the various phases of the reforestation program. This assistance which has been given without cost to the State, has enabled the Department more nearly to maintain the scheduled rate of operation, in spite of its greatly reduced appropriations. In addition to the regular activities, the C. C. C. forces have constructed truck trails, improved trout streams and made other minor improvements. The State of New York is very appreciative of the assistance rendered by the enrolled C. C. C. men and the cooperation of their superiors.

To sum up the total progress to date, the planting of the 135,000,000 trees above referred to has completed the planting operations on a total of 177,500 acres, or a little more than one-half of the total area contracted for. These lands are located in 32 counties of the State, extending generally from Rensselaer to Chautauqua and in Oneida, Lewis, Jefferson, Oswego, Franklin and St Lawrence counties on the western edge of the Adirondack Park.

It should be noted that New York State's program does not seek to acquire occupied farms, but is a means of assuring that abandoned farm areas of low grade will not in the future be returned again to agriculture.

Unlike the State Forest Preserve lands, there is no constitutional provision against lumbering on the reforestation areas and, therefore, it may be expected that in the future these lands will furnish a continuous supply of forest products for the use of the people of the State. In addition, they will afford areas for recreation, public hunting and fishing and at the same time, will protect the watersheds from which our cities and towns secure their water supply, and add greatly to the splendor of our beautiful State.

As in previous years, the Department is glad to extend to the school children of the State an opportunity to cooperate in this program by the planting of trees furnished by the State on these lands, under the direction of the local district forester. Any school desiring to assist in this manner should apply to the nearest district forester, who will assign to it an area for this purpose and will arrange to furnish the trees, tools and instruction in proper methods of planting. Later, if the plantation



Norway Pine Plantation, Saratoga County

Interior of a Norway Spruce Plantation, 24 Years Old, near Millbrook, Dutchess County

is successful, the Department will erect a suitable sign indicating the species and age of the trees planted and the name of the cooperating school.

During the past year the school children of the Stone School in Little Falls and the Mohawk High School have planted 8000 Norway pine transplants on state lands in Herkimer county, and the pupils of the East Otto Union School likewise planted 2000 trees on an area in Cattaraugus county. The Department is anxious to encourage further plantings on state areas by pupils of the public school system of the State.

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